What is claimed is:

1. An isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:18 and SEQ ID NO:19, or a homolog thereof, wherein said homolog has an at least 45 consecutive nucleotide region identical in sequence to a 45 contiguous nucleotide region of a nucleic acid selected from the group consisting of SEQ ID NO:18 and SEQ ID NO:19, but wherein the 45 contiguous nucleotide region is not in SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9 or SEQ ID NO:11.

2. The nucleic acid molecule of Claim 1, wherein a said nucleic acid molecule comprises a nucleic acid sequence that encodes a canine IL-5 protein.

3. The nucleic acid molecule of Claim 1, wherein said nucleic acid molecule encodes a protein that elicits an immune response against an IL-5 protein having an amino acid sequence selected from the group consisting of SEQ ID NO:5 and SEQ ID NO:10, or a protein that has IL-5 activity.

4. The nucleic acid molecule of Claim 1, wherein said nucleic acid molecule comprises the nucleic acid molecule nCaIL-5_{1658}.

5. The nucleic acid molecule of Claim 1, wherein said nucleic acid molecule is selected from the group consisting of:

(a) a nucleic acid molecule comprising a nucleic acid sequence that encodes a protein having an amino acid sequence selected from the group consisting of SEQ ID NO:5 and SEQ ID NO:10; and

(b) a nucleic acid molecule comprising an allelic variant of a nucleic acid molecule encoding a protein having any of said amino acid sequences of group (a).

6. The nucleic acid molecule of Claim 1, wherein said nucleic acid molecule is an oligonucleotide.

7. A recombinant molecule comprising a nucleic acid molecule as set forth in Claim 1 operatively linked to a transcription control sequence.

8. A recombinant virus comprising a nucleic acid molecule as set forth in Claim 1.

9. A recombinant cell comprising a nucleic acid molecule as set forth in Claim 1.

10. An isolated nucleic acid molecule having a nucleic acid sequence that is at least about 90 percent identical to a nucleic acid sequence selected from the group consisting of SEQ ID NO:18 and SEQ ID NO:19.

11. A therapeutic composition that, when administered to an animal, regulates an immune response in said animal, said therapeutic composition comprising a therapeutic compound that is an isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:18 and SEQ ID NO:19, or a homolog thereof, wherein said homolog has an at least 45 consecutive nucleotide region identical in sequence to a 45 contiguous region nucleotide region of a nucleic acid selected from the group consisting of SEQ ID NO:18 and SEQ ID NO:19; but wherein the 45 contiguous nucleotide region is not in SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9 or SEQ ID NO:11.

12. The composition of Claim 11, wherein said composition further comprises a component selected from the group consisting of an excipient, an adjuvant and a carrier.

13. The composition of Claim 11, wherein said therapeutic compound is a naked nucleic acid vaccine.

14. A method to regulate an immune response in an animal comprising administering to the animal a therapeutic composition comprising a therapeutic compound comprising a nucleic acid sequence selected from the group consisting of SEQ ID NO:18 and SEQ ID NO:19, or a homolog thereof, wherein said homolog has an at least 45 consecutive nucleotide region identical in sequence to a 45 contiguous region nucleotide region of a nucleic acid selected from the group consisting of SEQ ID NO:18 and SEQ ID NO:19; but wherein the 45 contiguous nucleotide region is not in SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9 or SEQ ID NO:11.

15. The method of Claim 14, wherein said animal is selected from the group consisting of canids and felids.

16. The method of Claim 14, wherein said composition further comprises a component selected from the group consisting of an excipient, an adjuvant and a carrier.

17. A method to produce an immunoregulatory protein, said method comprising culturing a cell capable of expressing said protein, said protein being encoded by a nucleic acid molecule selected from the group consisting of SEQ ID NO:18 and SEQ ID NO:19, or a homolog thereof, wherein said homolog has an at least 45 consecutive nucleotide region identical in sequence to a 45 contiguous region nucleotide region of a nucleic acid selected from the group consisting of SEQ ID NO:18 and SEQ ID NO:19; but wherein the 45 contiguous nucleotide region is not in SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9 or SEQ ID NO:11.

18. The method of Claim 17, wherein said cell expresses the nucleic acid molecule nCaIL-5_{1658}.